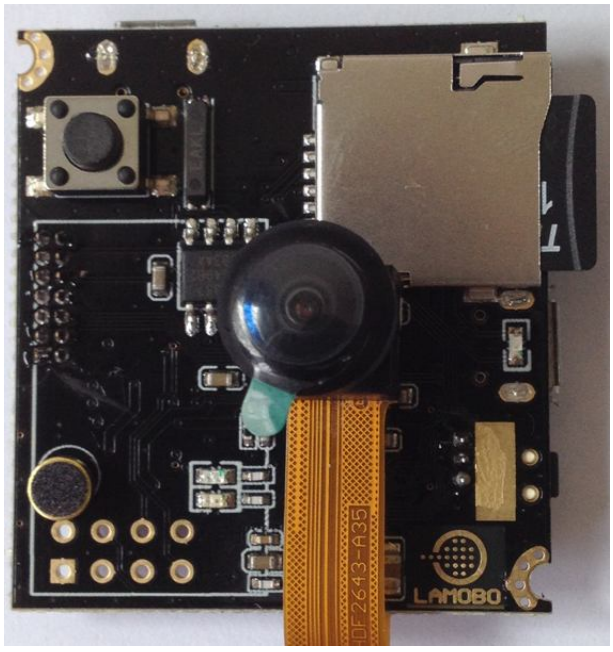
SinoVoip Co.,Limited

BPI-D1

User Manual



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Product Introduction

The BPI-D1 is the smallest open-source development board around, with a built-in HD mini camera. At 36mm (w) x36mm (l) and weighing in at 10g, it's much smaller and lighter than any mini-cam or camera board out there. It allows you to create and customize your own mini-cam and can be a valuable part of any cool hardware you are working on. The D1 prides itself on providing high-resolution image quality: Both video and photos are captured at 1280x720p with a video capture rate of 30 fps.

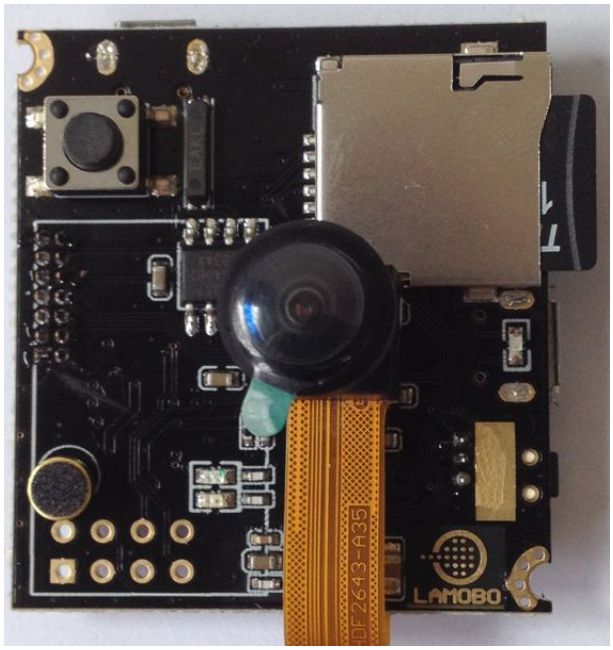
The BPI-D1 is designed specifically to give you all the multimedia tools you need in one small package. Simply connect to an external battery source (with your desired power capacity), and the D1 does the rest: there's a HD mini-cam, audio sensor, microphone, CPU, GPIO, WiFi, and more - you name it, the D1 has it.

Specification

Hardware specification	
Product size	PCB 36x36mm
CPU	400MHz ARM926EJ 32Bits RISC Core
RAM	64MB DDR2
Flash	16MB SPI-FLASH
Storage	Micro SD Card Seat ,supportable for 8G,16G, 32G TF cards
CMOS	CMOS Image Sensor SoC30FPS@720P, Visible light with 940 nm two-way infrared lens filter, with infrared night vision function
Lens	M7*P0.35 EFL=3.0mm/F.NO=2.8/View Angle=60°
Video	It achieves H.264 hardware encoding at 1280x720p_30fps. 32 gb TF card can store 120 hours of video data
Audio	MP3/WMA/AAC
WIFI	RTL8188EUS WIFI module embedded, support 802.11bgn and can switch AP or Normal mode
RTC	RTC circuit and supporting OSD
PM	Support Li-ion Charging with Built-in AXP173 power management chip
Mic	Embedded electret microphone
Power Consumption	Recording: 5V-200mA; WiFi On: 5V-350mA; continuously record 720P video or audio data for 24hour when a mobile power of 10000mAH is available.
GPIO	1UART/2GPIO；2PWM/2GPIO；I2C；AudioLineIN；HPAudioOutL；HPAudioOutR；1SPI Interface
UART	Independent UART debugging interface
USB	USB programmatic interface/ OTG device (WiFi module/USB drive)
DC IN	Micro-USB single +5V power input
Battery	3.7V Li-ion socket
OS	Running on Linux3.4.35, Kernel Operation system that makes secondary development possible

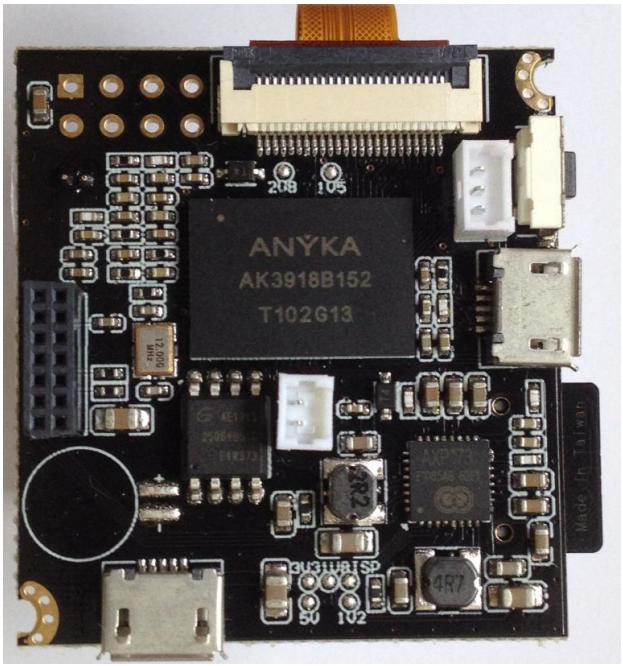
Hardware

- **Front:**



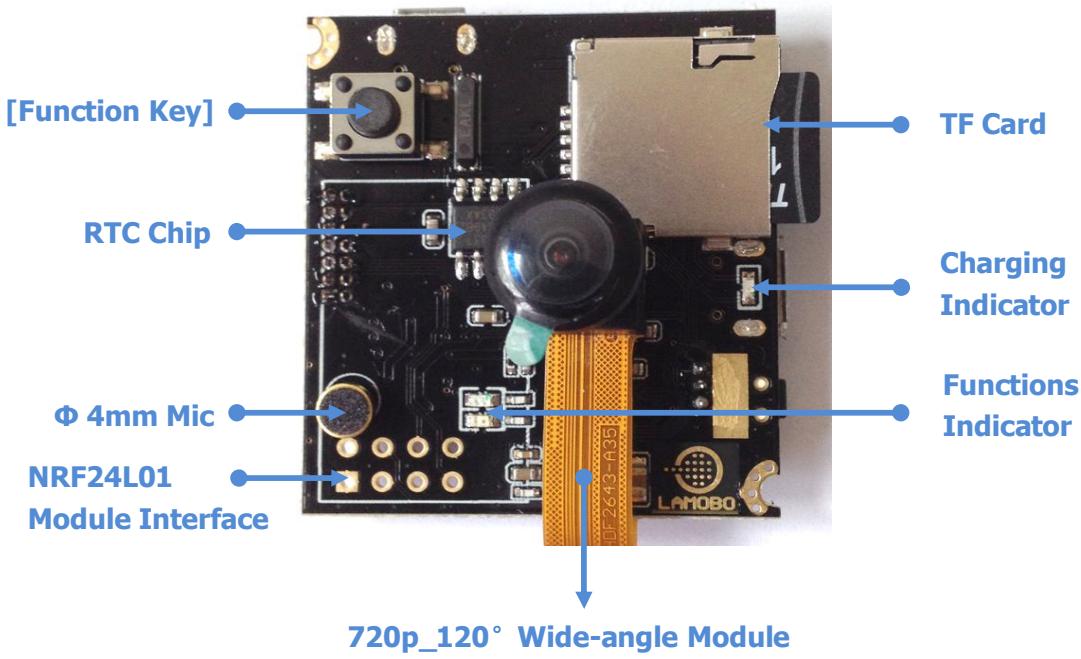
(Figure 1-Front)

- **Back:**

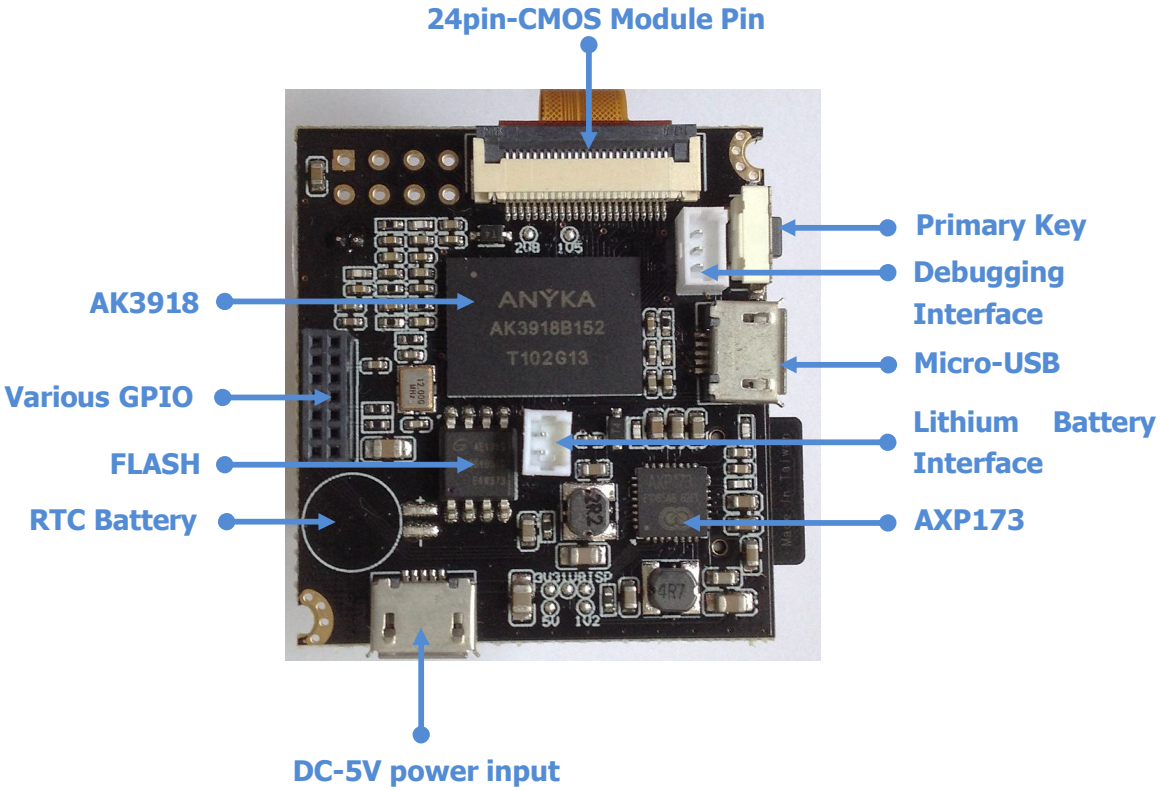


(Figure 2-Back)

- **Interface:**



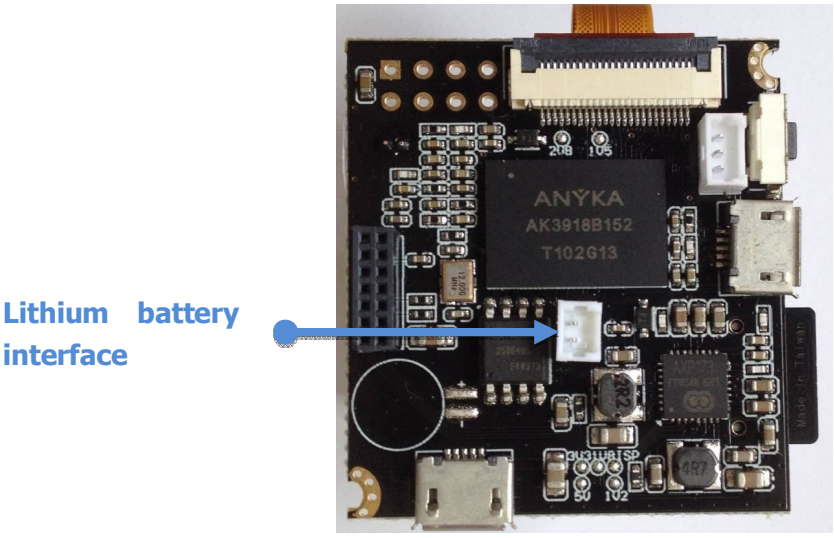
(Figure 3-Front Interface)



(Figure 4-Back Interface)

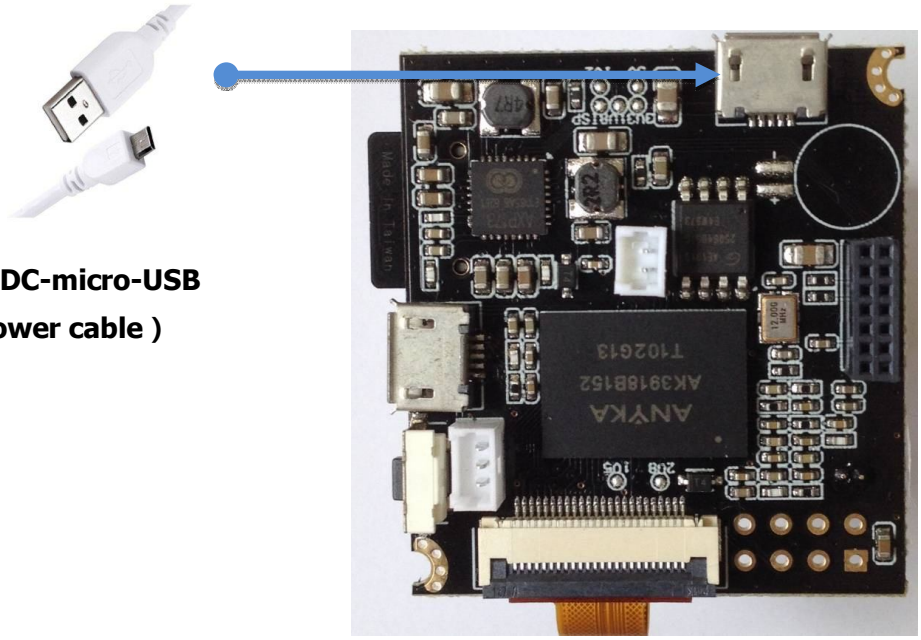
Power Supply

Battery mode: Built-in lithium battery power supply independently.



(Figure 5)

External power supply mode: DC-micro-USB power cable at the same time for charging the D1S built-in lithium battery.



(Figure 6)

Use Method

1. How to record a video

In a fully charged or connecting micro - power USB cable, press the D1S "primary key" button, D1S will automatically start the default set of video application. Start recording the video and sound and generate file storage to TF card. Recorded 30 minutes to automatically generate and save for a video file. Click the "primary key" button, then manually stop recording the current task and generate a complete video file, start the next record files at the same time.

[Reminder]: Micro-USB interface supports USB flash disk connected through USB female port of OTG cable, when there is no TF card, support recording videos directly to the external USB drive.

2. How to connect to the AP

One-click connect the WiFi-AP

1) The USB-WiFi module is connected to the USB interface of OTG, and the OTG port micro-USB is connected to D1S.
2) Micro-USB power cable is connected to the D1S and open the D1S power;
3) Long click the "function key" (3 seconds), then start the D1S WPS connection function, if press the WPS button on the AP at the same time, D1S will achieve a key to connect to the network environment AP through WPS function.

Connect to the specified AP

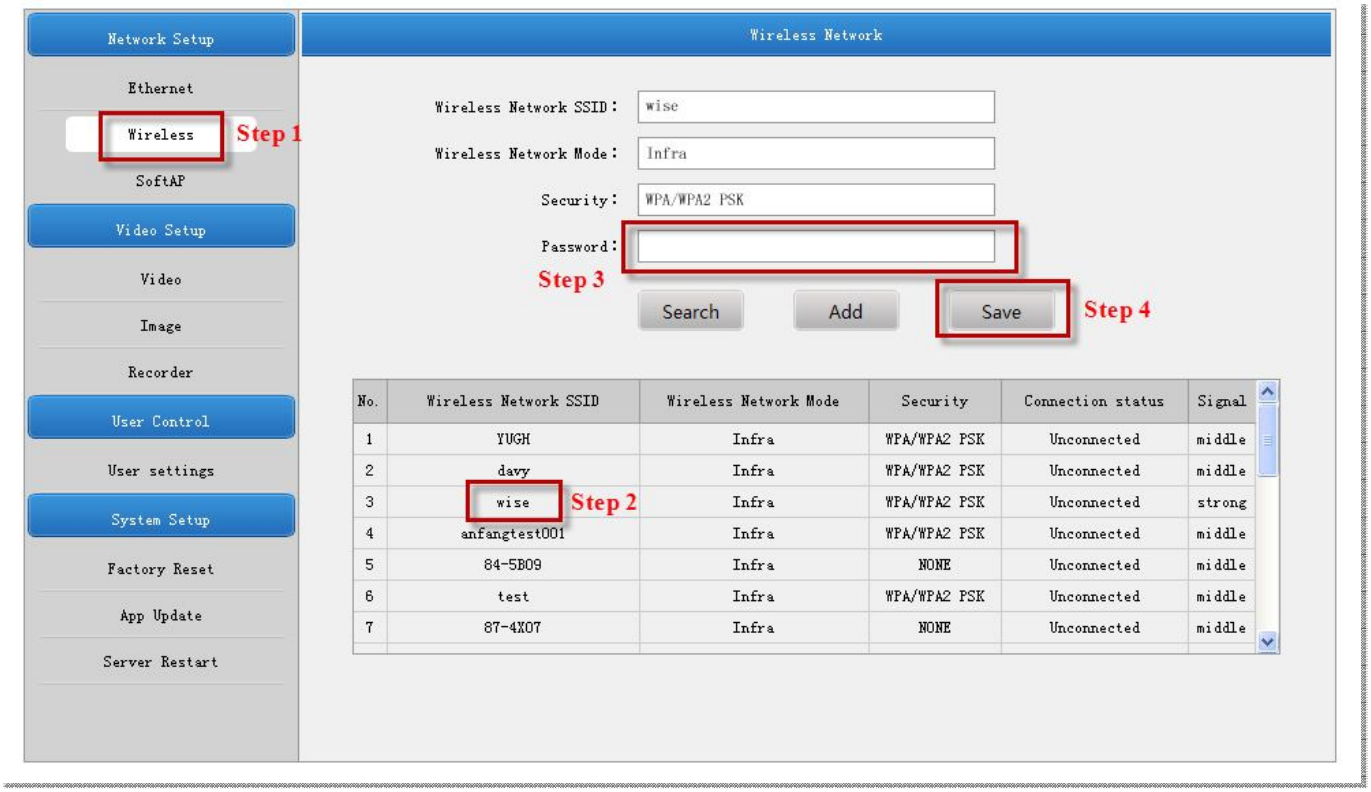
The USB-WiFi module is connected to the USB interface of OTG. Press the D1S "primary key" button, green LED will keep long bright after flashing about 8 seconds; it means D1S work in AP mode.

1) Connect any mobile devices (e.g. smartphone, tablet or computer) to the WiFi connection "**SSID= BPI_D1_XXYYZZ**" and enter the default password "**12345678**".
   [Reminder]: "BPI_D1_XXYYZZ" is D1S's default AP name; "XXYYZZ" represents the WiFi MAC address of the last 6. If you restore the factory settings in the settings page, the SSID name will be reset to "ak39".

2) In Internet Explorer, enter the FTP address "ftp://192.168.0.1". **(user name: admin, password: admin)**

3) Click "Ethernet", select one of the available WiFi. The SSID parameter will be displayed in the above, click password blank and enter the known password, then click the "save". After flashing on the screen, four parameters in the form disappeared that the connection is successful.

4) Click on the (39) Boot/WPS button, D1S switches to slave mode; you will see LED flashes from fast into slow, which has been connected to the specified WiFi-AP.


Network Setup
Ethernet
Wireless
Step 1
SoftAP
Video Setup
Video
Image
Recorder
User Control
User settings
System Setup
Factory Reset
App Update
Server Restart
Wireless Network
Wireless Network SSID: wise
Wireless Network Mode: Infra
Security: WPA/WPA2 PSK
Password:
Step 3
Search
Add
Save
Step 4
No. | Wireless Network SSID | Wireless Network Mode | Security | Connection status | Signal
1 | YUGH | Infra | WPA/WPA2 PSK | Unconnected | middle
2 | davy | Infra | WPA/WPA2 PSK | Unconnected | middle
3 | wise | Infra | WPA/WPA2 PSK | Unconnected | strong
Step 2
4 | anfangtest001 | Infra | WPA/WPA2 PSK | Unconnected | middle
5 | 84-5B09 | Infra | NONE | Unconnected | middle
6 | test | Infra | WPA/WPA2 PSK | Unconnected | middle
7 | 87-4X07 | Infra | NONE | Unconnected | middle

(Figure 7)

3. How to view files

Option①： Remove the SD card from the board and insert it into the SD card reader of a computer.

Option②： Battery mode, using micro-USB data cable to connect the D1S and PC. PC client can access the contents of TF card through the data cable, while charging the lithium battery.

[Reminder]: Micro-USB interface supports USB flash disk connected through USB female port of OTG cable, Support directly copy files from the TF card to the external usb drive.

Option③： Connect PC or mobile devices to the SSID access point named"BPI_D1_XXYYZZ", and access files at the FTP address ftp://192.168.0.1.

[Reminder]: Support IE, Chrome, Opera, Safari or Firefox browser login FTP to view or download. If you need play the video you will need to install player support for H.264 or MJPEG decoding format.

4. How to set

Record Parameters Settings

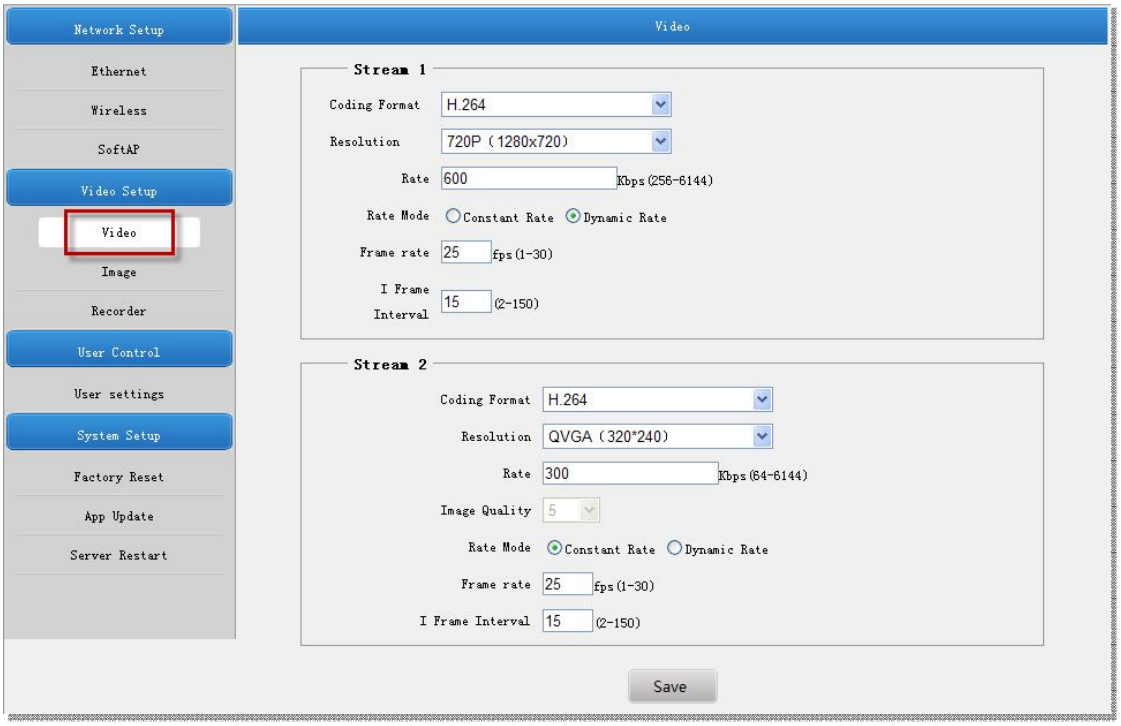
When D1S power is ON, video recording will start automatically according to the default set. If you want to set the D1S video parameters, you can refer to the following steps:

1. Switch on the WiFi and switch to the AP mode (The LED light will remain steady). Connect any mobile devices (e.g. smartphone, tablet or computer) to the WiFi, connection "**SSID= BPI_D1_XXYYZZ**" and enter the FTP address "ftp://192.168.0.1".
   [Reminder]: User Name: admin; **Password:** admin

2. Click the "Video Settings" or "Record Settings" can adjust the record parameters.
   [Reminder]: After saving the changed settings , all setup are validated only after manually re-open after switching off the device.

Video Settings

"Video" related to the format of the final recorded and resolution, devices support the two coding formats which are H.264 and MJPEG; relevant parameters can be set manually according to the required. After setting , click "Save".



(Figure 8)

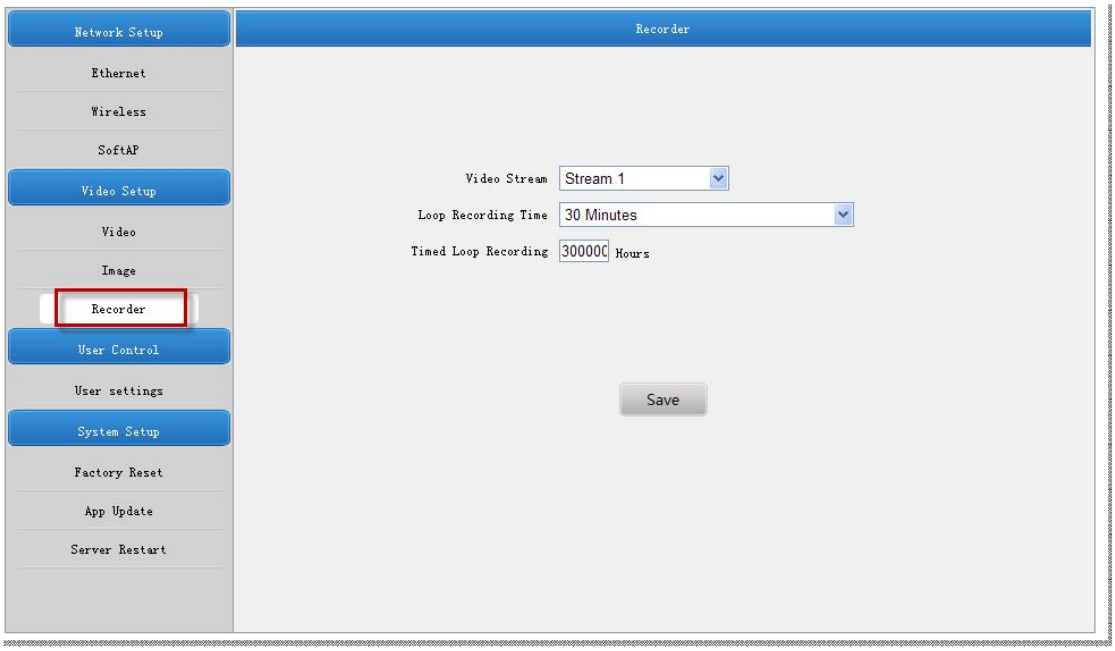
Record Settings

"Record" related to recording save time, the number of video files and the size of video files, devices support the two coding formats, setting Loop Recording Time and Timed Loop Recording; relevant parameters can be set manually according to the required. After setting , click "Save".

Video Stream: Choose the two streams in the "Video" which are H.264 and MJPEG.

Loop Recording Time: Finish a video and save a file according to setting recording time.

Timed Loop Recording: Start recording according to Loop Recording Time setting after switch on the device , beyond the setting time automatically stop recording.



(Figure 9)

[Reminder]: Video resolution depends on choosing a different video stream, and the generated video file size will be different.

Relevant Information

WiFi LED at work

D1S "function key" button, click open WiFi AP mode, and then click close. "Green LED"will flash for about 8 seconds:

LED Status	Description
Light	WiFi work in AP mode, you can search the AP SSID. (for example, **BPI_D1_XXYYZZ**)
Flash	WiFi work in slave mode, it will automatically connect the AP that set the parameters before.

WiFi ON/OFF Energy Consumption

WiFi ON/OFF to save the power consumption, the two statuses generally as follows:

1. WiFi OFF, D1S is recording and saved to TF card, current 5V power is about 250mA.
2. WiFi ON, D1S is recording and saved to TF card, at the same time D1S connected to the network through WiFi , current 5V power is about 350mA.
3. It can be used to predict 500mah lithium batteries can maintain D1S work 1 to 2 hours.

Program the Firmware

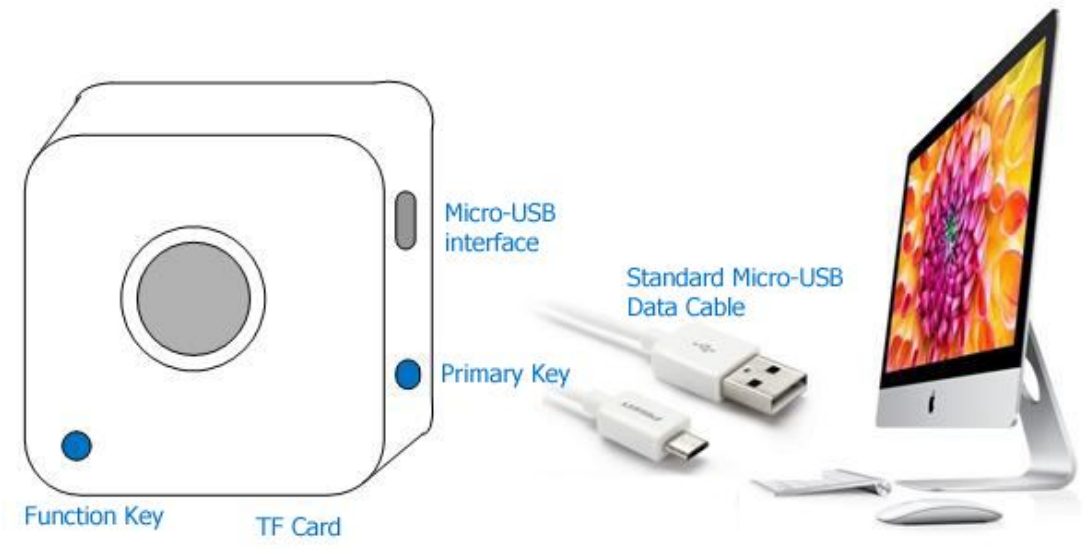
Important Notes before You Start:

1. You must use the compatible version of the firmware programing software with source codes.
2. The software works on Windows XP Service Pack 3 and newer versions.
3. The software file path is located at: **/BPI.dev/tool/burntool** in the code directory
4. Before programing the firmware, please make sure to copy and paste the 3 compiled files **"zImage," "root.sqsh4," and "root.jffs2"** to the root directory.

   (**Note:** The complied files are saved at: **/BPI.dev/output**)

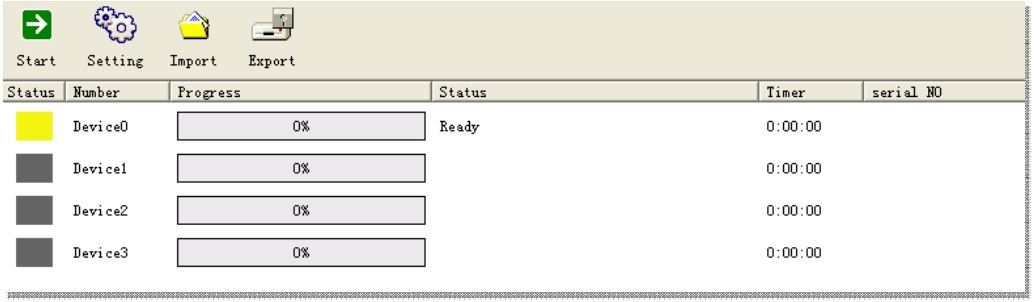
How to Program the Firmware

1. Battery mode, press and hold the "primary key" 5 seconds off D1S power. Holding down the "function key" and micro-USB data cable connecting to the PC, the module enters the programming mode. At this time D1S LED no instructions.



(Figure 10)

2. Before the PC inserts D1S micro - USB cable, double-click firm programing tools icon, runs the burn tool. The firm programing tools will detect the launch of the application. Once connected, a yellow status bar will appear next to the device in the window, and the status will show "Ready" (please recheck and repeat the steps above if no response). Press the "Start" button on the top to start the firm programing automatically.



(Figure 11)

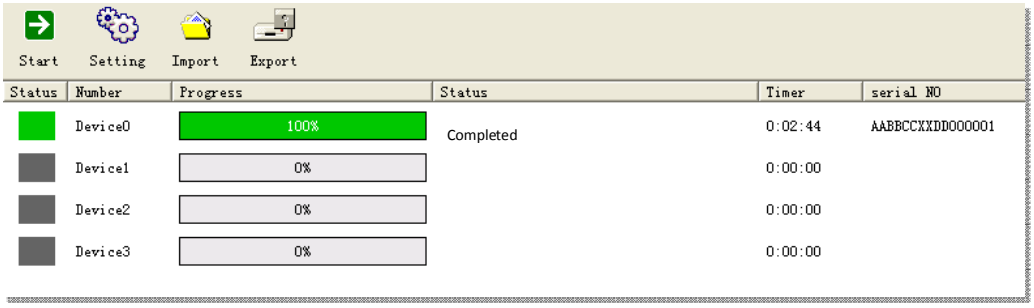
3. Burning completed, micro-USB data cable disconnected with PC.

Status Descriptions

The status, progress and elapsed time will appear in the programing window.

[Successful]

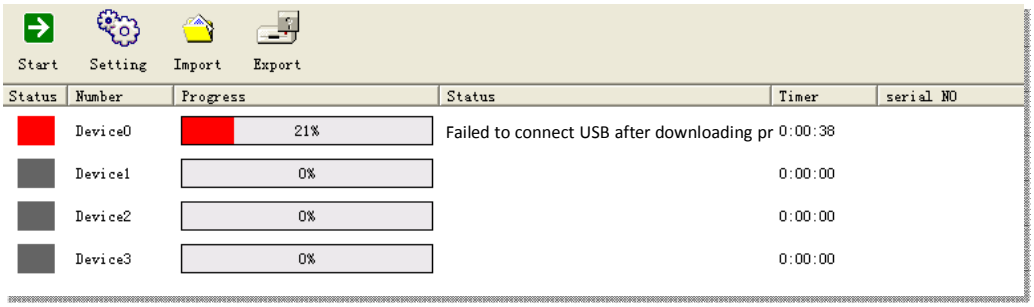
Once the status and progress bar turn green, the progress bar reaches 100%, and the status reads "Completed," the firmware has been programmed successfully.



(Figure 12-Programing Successful)

[Unsuccessful]

When the status and progress bar turn red, the status area will display one of several error messages, indicating an unsuccessful programing attempt.



(Figure 13-Unsuccessful Programing)

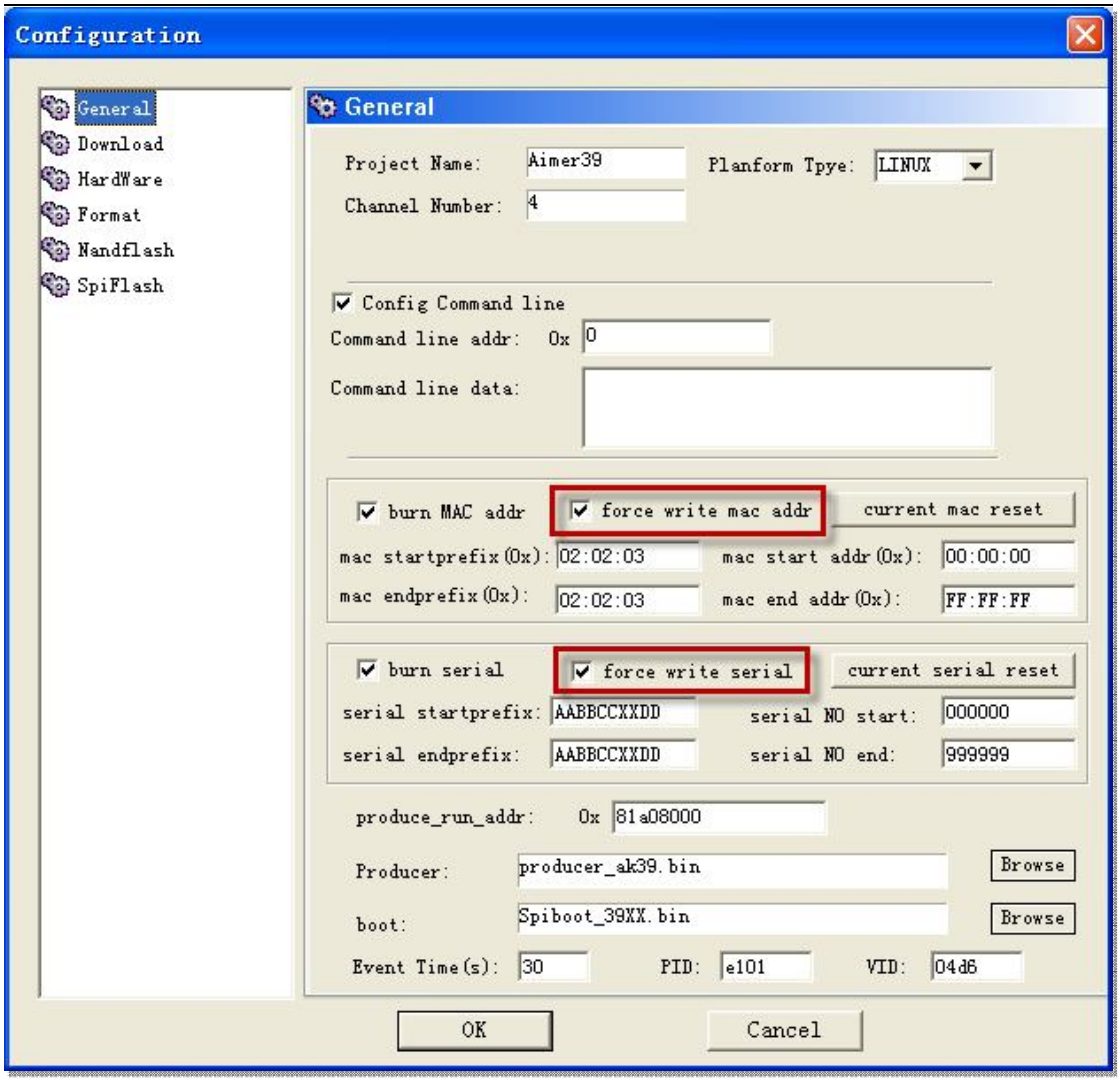
If the operation is unsuccessful, please retry after adjusting the following settings:

1. Click Settings, select "Researcher" as the User Name, leave the Password blank, and then select "OK".

(Figure 14)

2. Choose "General" on the left-side menu and check the two boxes "force write to the mac address" and "force write serial number," and then select "OK."

3. Repeat steps 1-3 in the "How to Program the Firmware" and try again.


Configuration
General
Download
HardWare
Format
Nandflash
SpiFlash
General
Project Name: Aimer39
Planform Tpye: LINUX
Channel Number: 4
Config Command line
Command line addr: 0x 0
Command line data:
burn MAC addr
force write mac addr
current mac reset
mac startprefix(0x): 02:02:03
mac start addr(0x): 00:00:00
mac endprefix(0x): 02:02:03
mac end addr(0x): FF:FF:FF
burn serial
force write serial
current serial reset
serial startprefix: AABBCCXXDD
serial NO start: 000000
serial endprefix: AABBCCXXDD
serial NO end: 999999
produce_run_addr: 0x 81a08000
Producer: producer_ak39.bin
Browse
boot: Spiboot_39XX.bin
Browse
Event Time(s): 30
PID: e101
VID: 04d8
OK
Cancel

(Figure 15)